

METHOD AND APPARATUS FOR REDUCING ACOUSTIC NOISE

ABSTRACT OF THE DISCLOSURE

A squeeze film damper reduces acoustic wave transmission by the damping and spring forces produced by squeezing a very thin layer of air trapped between two vibrating plates. The damping effect is most pronounced when the gap between vibrating plates is very small, e.g., of the order of micrometers, thus, the squeeze film dampers have two, very closely-spaced opposing plates, the top of which vibrates out-of-phase with respect to the lower plate, when the lower plate is attached to a vibrating surface. The relative motion of plates squeezes out the thin film of air trapped within the plates and adds substantial amount of passive damping over a wideband of frequency to the base vibrating structure thereby reducing vibrations and noise radiated by the structure. The out-of-phase displacement of the top plate, with respect to the bottom plate, tends to cancel acoustic energy imparted to the lower plate by a vibrating surface. Squeeze film dampers can be applied in arrays to a vibrating surface.